

Minutes of Meeting of
Drafting Team on RfG (DT RfG)
DSO Technical Expert Group (DSO TEG)

Date: 22 August 2011
Time: 11h00 – 16h00
Place: ENTSO-E, Brussels

Participants

Name	Affiliation	present	excused
<i>DT RfG</i>			
Hans Abele	ENBW		X
Dimitrios Chaniotis	ENTSO-E	X	
Luis Coronado	REE	X	
Anders Danell	SVK	X	
Torsten Haase	50Hz		X
Edwin Haesen	ENTSO-E	X	
Jako Kilter	Elering	X	
Sergio Martinez Villanueva	REE		X
Mark Norton	EirGrid	X	
Ramūnas Poneis	Litgrid	X	
Ralph Pfeiffer	Amprion	X	
Thibault Prevost	RTE	X	
Jerzy Rychlak	PSE		X
Guillemette Smadja	Elia	X	
Helge Urdal	National Grid	X	
Mario Valente	Terna	X	
Wilhelm Winter	Tennet		X
<i>DSO TEG</i>			
Falk Engelmann	VKU e.V.	X	
Bruno Gouverneur	Synergrid	X	
Mike Kay	GEODE	X	
Tony Hearne	ESB Networks	X	
Riccardo Lama	Eurelectric	X	
Johan Lundqvist	GEODE	X	
Pavla Mandatova	Eurelectric	X	
Walter Schaffer	GEODE	X	
Siegfried Wanzek	E.ON-Energie	X	

The Drafting Team (DT) convener welcomes the DSO Technical Expert Group (TEG). The goal of this meeting is to analyze the DSO TEG comments on the Requirement for Generators (RfG) draft

All participants at the meeting briefly present themselves.

An agenda has been proposed by the DSO TEG which is agreed on by the DT:

- DSO integration in the drafting process of all relevant codes (not only grid connection but also system operation): involvement in decision making (and not only discussions), formalization of cooperation
- ENTSO-E feedback on our remarks on draft requirements and on our remarks on FAQs
- ENTSO-E presentation on why FRT (particularly for distribution system faults) is a cross-border issue
- Compliance issue
- Changes to the network code on generators connection after final version of the FG
- How to avoid inconsistencies/ risks for DSOs between the two codes and the System Operation
- Relation between functionalities in the code and technical standards

Overview of NC on RfG draft

Comments by the DSO TEG¹ were sent prior to this meeting and are now one by one discussed and clarified.

The comments are built up by assessing the cross-border impact of all requirements in the RfG draft. Three categories are identified by the DSO TEG.

- ➔ Remark: What is the definition of a cross-border issue according to the DSO TEG?
 - The DSO TEG states that an issue should be perceived as of cross-border nature for the purposes of this code if it has impact on more than one system/nation. To list the type of events that fall under this category one should perform a case-by-case analysis.
 - The DT clarifies that all elements in the draft are considered to be cross-border issues. A definition has been given in the FAQ list published². Some requirements may be a relevant cross-border issue from the perspective of a single unit. However, from a system engineering view, the behavior of a number of units needs to be considered and their total impact on the system performance, which can clearly be of cross-border relevance.

The DSO TEG claims that some issues will always be local, e.g. voltage problems in a LV system. A DSO could identify a local problem based on the element of time: Transmission faults are dealt with in a matter of a few hundred milliseconds while distribution faults will last longer. DSO TEG claims that the most severe voltage problems on distribution will remain local. The DSO TEG is assured that small generation only affects small parts of the system and that most requirements for small generators are as such out of scope for this RfG NC.

The DT argues that most of the major system disturbances of the last decades have been of voltage collapse nature. Fault duration is not an admissible criterion to distinguish local issue from wide-spread ones. Even faults which are cleared fast can result in cascading aggravation, if performance of generating units in particular is inadequate.

The following gives the additional arguments given on the comments by the DSO TEG. The resulting decisions of the DT made after the meeting are given as well for completeness and are indicated in *italic*.

The article numbers refer to the RfG draft version of 22 March 2011³

Article 7.1.a

¹ See document "020811 DSO Experts comments to ENTISOE.pdf"

² https://www.entsoe.eu/fileadmin/user_upload/library/SDC/Pilot_code/110711-Pilot_Code_FAQ.pdf

³ https://www.entsoe.eu/fileadmin/user_upload/library/news/110322_Pilot_Network_Code_Connections.pdf

Is automatic disconnection with respect to frequency deviations specified at the level of the inverter or at the coupling point of the customer with the grid? If disconnection is not allowed, this does not imply directly that the generator must remain infeed.

→ *The requirement for disconnection due to frequency deviations from its nominal value will be rephrased in order that in case of connection to the grid power infeed is to be maintained with the boundaries prescribed in the NC.*

The DSO TEG asks whether there is a conflict with disconnection requirements in islanding mode. The DT clarifies that requirements on generator capabilities do not imply that other loss-of-mains protection settings should be used.

Article 7.1.b

What should happen if the ROCOF is much higher than 2Hz/s? Should the disconnection be faster? The DT clarifies that with very high ROCOF the issue will become a frequency issue in which a faster disconnection can be allowed.

The DSO TEG asks why the relatively high value of 2Hz/s is used (cfr. GB situation where it is presently much lower). The DT explains the set point is based on machine capability and was decided upon after discussion with manufacturers. Again, the Power Generating Unit capability is not in conflict with possible loss-of-mains settings.

→ *The draft will be adjusted to state that disconnection due to loss-of-mains protection is admissible.*

Article 7.1.c.2

The DSO TEG points out an ambiguity in the text. It could be understood that Frequency Sensitive Mode is a requirement for type A and B units, which it is clearly not.

→ *The reference to Article 9.2.c is removed from Article 7.1.c. Article 9.2.c itself is modified to clarify that Article 7.1.c does not apply when operating in Frequency Sensitive mode.*

Article 7.1.d

The DSO TEG states this is out of scope for the RfG. It should be let over to the DSO to manage generation connected to the distribution system. The DT clarifies the article prescribes generator capabilities, the code does not imply in itself that a TSO will switch generation at distribution level. The DSO TEG asks how switching actions can be taken or requested by an operator that has no information on measurements. The DT refers to the section on Information Exchange.

The DSO TEG states it would be useful if the NC would raise issues that can be taken on by standardization organizations, e.g. CENELEC. The DT argues that the network code provides a binding framework for future standards when established by means of a regulation (EC).

The DSO TEG emphasizes that requirements for real-time information exchange should be moderate. Mandate 490⁴ which also deals with this issue is not yet cleared out. The DT acknowledges this and has therefore drafted the code in such a way it keeps possibilities open while remaining within the FWGL.

The DSO TEG asks if more specifics on information exchange will be dealt with in other codes. The DT cannot make a statement, because this depends on the objectives of each code.

⁴ http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/2011_03_01_mandate_m490_en.pdf

The DSO TEG anticipates that Power Generator Unit Operators may eventually not want to share all the information prescribed in the Information Exchange sections. The DT clarifies that since this code will become a European law a DSO has the absolute right to demand the information prescribed. Standards are not obligatory and as such not sufficient. The DSO TEG argues that these data are no longer related to cross-border issues and are as such out of scope for the RfG. The DT points out the relevant passage in the FWGL (Article 3.2⁵) on which the RfG article is based. The DSO TEG states this asks for a solid definition on the term 'significant user'. The DT argues that since the aggregation of a large number of small generators (e.g. PV units) can have a severe cross-border impact, even requirements for type A units are justified. The DSO TEG notes that the significance should be looked at with respect to system parameters. All parameters listed by the ACER FG should be part of the EU network code but only for types of generators for which they are generally relevant with respect to cross-border impact.

Article 8.2.a

The DSO TEG asks what the link is between controllable active power steps and frequency stability. The DT acknowledges that active power control is not exclusively a frequency stability issue.

➔ *The requirement is shifted to Article 8.4 on general system management.*

Article 9.4.b

The DSO TEG asks why island operation requirements are given in the RfG? The DT argues it facilitates quick restoration of the interconnected system in an integrated energy market. It is also possible that islands are cross border. The RfG does not aim at deeply embedded islanding situations in the distribution system.

Articles 9 and further

The DSO TEG stresses that most of its comments for the remainder of the RfG are based on the same argument, i.e. that since it does not involve cross-border issues the requirements should not be part of this code.

General questions on the RfG

General remarks are given on the RfG text.

The DSO TEG believes that even with a European law, discussions on connection agreement modalities will not be made easier.

In the UK small generators such as 10MW can exceptionally be connected to a 132kV grid due to the geographical situation. Intuitively these should be type B generators, but in the strict sense of the RfG draft it will be type D (above 110kV). The DSO TEG asks how this will be dealt with, e.g. adaptation of Article 3, derogations, ...? Also the situation is pointed out where HV lines are built to accommodate a large number of small wind turbines.

➔ *After due consideration of different options, the DT has decided to maintain the definition of Article 3*

⁵ "Information exchange provisions contained in network code(s) shall include sufficiently detailed specifications for an efficient coordinated system with access to real-time information. The network code(s) shall set the requirement for every significant grid user to be able and obliged to provide the necessary real-time operational information to the DSO and TSO that their connection has significant impact upon."

The present RfG draft shows the phrase “in the conditions set forth by national legislation, Connection Agreement or any other bilateral contracts” in shaded gray a large of times throughout the text. The DSO TEG asks for clarification on this. If all options for implementation and/or parameter setting remain open, then why is it taken up in this network code? The DT states the code requirements are based on the principle of subsidiarity proportionality so that on a European level the same ideas apply while some parameters can be based on regional differences. It is stressed that the phrase is preliminary and subject to further legal review and itself does not impose a hierarchy between national laws, connection agreements or other contracts. It is also very well possible that in the final code these gray sections will not be replaced everywhere by the same final requirement. The DSO TEG is concerned that the code could have the potential to ‘turn off’ requirements in national level, e.g. for reactive capabilities by setting a power factor equal to one. Both the DSO TEG and the DT agree that since European law will be inflexible, the network code should provide flexibility by delegating more detailed requirements to national levels where appropriate.

In Article 3 thresholds in power rating are used to classify generators in different types. The DSO TEG asks whether it will be likely that e.g. a 5MW threshold will be circumvented by placing two 2.5MW units, or one 4.9MW unit? The DT will take this argument into consideration and already puts forward this should be discussed in the network code on Connection Procedures.

DSO integration in the drafting process

Request from the DSO TEG on their role in the NC drafting:

- for all relevant codes, i.e. not only grid connection but also system operation;
- involvement in decision making, not only discussions;
- formalization of cooperation.

The DT explains that the drafting the pilot code is a process of learning by doing, hence coordination evolves as well. This meeting in itself is an important element of coordination. To formalize this, the meetings will be made public after the public consultation period. The DSO TEG agrees and welcomes requests for involvement through discussions. The position of ENTSO-E on possible further formalization will be discussed internally in September by the Board.

The DSO TEG expects a work program with a timetable to give a clear picture where DSO involvement is expected. The DT states that the internal timeline is being reassessed because of the delayed publication of the final FWGL. It cannot be confirmed at this moment if or when a timeline will be communicated.

The DSO TEG asks if the deadline indicated in the EC letter is under discussion. The DT reiterates that the time needed to finalize the code is still to be assessed.

Elaboration on fault-ride-through requirements

The DSO TEG asks for clarification on the FRT requirements given in Article 11.3.a. Are the voltage percent values expressed in terms of nominal voltage or pre-fault voltage? The DT refers to the Figure 5 where the caption states the voltage percent values are expressed as “the voltage at the Connection Point, expressed by the ratio of its actual value and its nominal value in per unit before, during and after a fault”.

The DSO TEG asks to which parameters the fault-clearance times would be set. The DT states this is not the issue in this network code, the text deals only with generator capabilities.

The DSO TEG asks who would specify the parameters, DSO or TSO. The DT refers to Article 11.3.a.1: "Each TSO shall have the right to define, in the conditions set forth by national legislation, Connection Agreement or any other bilateral contracts..."

The DT also stresses that generator FRT requirements are not set to be able to ride through a 0pu voltage on distribution level.

Compliance issues

The DSO TEG gives their experience in Great Britain. Historically wind turbine control schemes were best understood by manufacturers and TSOs. Compliance was laid down in bilateral contracts between wind turbine operators and the TSO. After a time the responsibility was transferred to the DSO level since the grid code was based on MW thresholds. However, since a TSO has the most expertise in this field and they care the most for compliance, there are clear practical reasons why this responsibility should be with the TSO. The DT acknowledges similar experiences with regards to competences. The DT refers to the FWGL Article 2.1.1⁶ which is very clear in assigning the responsibility for distribution connected generation to the DSO.

The DSO TEG claims it is impossible & highly inefficient for DSOs to send out thousands of people to check compliance for every single PV installation. The DT argues that type-based certification is admissible. DSOs need to build up expertise in this matter or refer to 3rd parties to provide these services.

The DSO TEG argues that the RfG code is too detailed on the aspect of compliance testing. The DT refers to the detailed prescription of Article 2.4 in the FWGL the code needs to be in line with.

The DSO TEG believes compliance testing of functionalities adds complexity. However, TSOs have always worked like this. The DSO TEG argues that TSOs have a relatively small number of units to test. Since there is a large diversity in manufacturers to which compliance needs to be tested, the DSO TEG believes the NC requirements need to be broken down in standards and as such the NC should be a clear guideline towards relevant standards.

The question is raised if it would be possible that products that do not comply with a given list of requirements are prohibited by law to be installed or sold? A question like this was raised in Spain, but was unsuccessful.

Changes to NC after final version of FWGL

The impact of the final FWGL is still being assessed.

⁶ "Regarding significant grid users connected to the distribution network, any requirements on system operators for adaptation of existing arrangements (as defined in section 2.3, including in respect of distribution network codes and connection agreements) and for ensuring that distribution-connected significant grid users meet the requirements set out in the network code(s) shall be the responsibility of the DSO."

Possible inconsistencies between codes

The DSO TEG asks how inconsistencies between the code on RfG, Demand Connection and the one(s) resulting from the FWGL on System Operation can be avoided. The DT indicates this is the responsibility of ENTSO-E and acknowledges the need for cross-comparison and synchronization.

Relation between functionalities in code and technical standards

Discussed earlier

Open questions

Article 1.3 in the FWGL states: "Issues involving the active participation by grid users are addressed in these Framework Guidelines". It is not clear for the DSO TEG how this is to be interpreted. It is neither for the DT at this moment.

Since some elements already came up during the meeting where TSOs have more experience on the behavior of power systems in critical conditions (e.g. voltage collapse, fault-ride-through), the DSO TEG would appreciate an open technical FAQ. The DT will take this into consideration and sees several options, e.g. extending the already published FAQ or integrating it in a position paper which is being written to give the argumentation of the RfG. The DT is open to any technical questions the DSO TEG may have on power system issues being addressed in the scope of the RfG.

The DSO TEG would appreciate feedback from the DT on the comments given.

The meeting is closed.